Patent Claims

1. A turbo-compound system,

1.1 having a crankshaft (1.1) driven by an internal combustion engine (1);

1.2 having an exhaust gas turbine (2) arranged in the exhaust-gas flow of the internal combustion engine (1);

1.3 having a hydrodynamic coupling (3), comprising a primary impeller (3.1) and a secondary impeller (3.2), which together form a working chamber (3.3), which can be filled or is filled with a working medium, the hydrodynamic coupling (3) being arranged in a driven connection between the crankshaft (1.1) and the exhaust gas turbine (2) in such a way that, when the working chamber (3.3) of the hydrodynamic coupling (3) is filled, for the exhaust gas turbine (2) driven by the exhaust-gas flow, driving power is transmitted from the exhaust gas turbine (2) to the crankshaft (1.1);
characterized in that

1.4 a switching means for reversing the direction of rotation of the primary impeller (3.1) or of the secondary impeller (3.2) of the hydrodynamic coupling (3) is provided..

2. The turbo-compound system according to claim 1, further characterized in that the switching means comprises a flow conducting device in the exhaust-gas flow, which, for reversing the direction of rotation of the primary impeller (3.1), which is disposed in the hydrodynamic coupling (3) on the side of the exhaust gas turbine, changes the direction

of flow of the exhaust gas in such a way that the direction of rotation of the exhaust gas turbine (2) is reversed.

3. The turbo-compound system according to claim 2, further characterized in that the flow conducting device comprises a conducting grid or a conducting apparatus of the exhaust gas turbine (2).

4. The turbo-compound system according to claim 1, further characterized in that the switching means comprises a switching gear (4).

5. The turbo-compound system according to claim 4, further characterized in that the switching gear (4) is designed in the form of a reversing gear, which is positioned in the driven connection between the crankshaft (1.1) and the secondary impeller (3.2), which is disposed in the hydrodynamic coupling (3) on the side of the crankshaft.

6. The turbo-compound system according to claim 4, further characterized in that the switching gear (4) is designed in the form of a reversing gear, which is positioned in the driven connection between the exhaust gas turbine (2) and the primary impeller (3.1), which is disposed in the hydrodynamic coupling (3) on the side of the exhaust gas turbine.

7. The turbo-compound system according to claim 4, further characterized in that the switching gear (4) is disposed parallel to the hydrodynamic coupling (3) and comprises a

shift coupling (4.1), by means of which the primary impeller (3.1) and the secondary impeller (3.2) of the hydrodynamic coupling (3) can be switched to a mechanical driven connection with opposite directions of rotation.

8. The turbo-compound system according to claim 7, further characterized in that the shift coupling (4.1) is designed as a multidisk coupling.

9. The turbo-compound system according to claim 7, further characterized in that the shift coupling (4.1) is designed as a hydrodynamic coupling.

10. The turbo-compound system according to one of claims 7 to 9, further characterized in that the switching gear (4) is designed as a planetary gear with a shift coupling (4.1).